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EXAMINER
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PHASGE, ARUN S

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SHIN SATO

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Appeal 2009-003331  
Application 10/791,829  
Technology Center 1700

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Decided: August 18, 2009

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Before BRADLEY R. GARRIS, TERRY J. OWENS, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL  
STATEMENT OF THE CASE

The Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1, 2 and 4-7, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

*The Invention*

The Appellants claim an electrodeionization apparatus. Claim 1 is illustrative:

1. An electrodeionization apparatus comprising:

an anolyte compartment having an anode;  
a catholyte compartment having a cathode;  
concentrating compartments and desalting compartments  
wherein the concentrating compartments and the desalting compartments are  
formed between the anolyte compartment and the catholyte compartment by  
arranging alternately at least one anion-exchange membrane and at least one  
cation-exchange membrane;  
ion-exchanger with which the desalting compartments are filled;  
at least one of ion-exchanger, activated carbon, and electric conductor  
which fills the concentrating compartments;  
a device for introducing electrode water into the anolyte compartment  
and the catholyte compartment, respectively;  
a concentrated water introducing device for introducing concentrated  
water into the concentrating compartments;  
a device for feeding raw water into the desalting compartments to  
produce deionized water; and  
outlets formed at the desalting compartments for taking out the  
deionized water;  
wherein the outlets of the desalting compartments are connected to the  
concentrated water introducing device to introduce a part of the deionized  
water containing at least one of silica and boron at a lower concentration  
than the raw water and obtained from the desalting compartments into the  
concentrating compartments at a side near the outlets for the deionized water  
of the desalting compartments;  
the concentrated water introducing device makes the concentrated  
water flow out of the concentrating compartment at a side near an inlet for  
the raw water of the desalting compartment;  
at least a part of the concentrated water flows out of the concentrating  
compartments out of a circulatory system;  
the desalting compartments are filled with an anion exchanger and a  
cation exchanger in such a manner that anion exchanger/cation exchanger  
volume ratio becomes 8/2 to 5/5; and  
at least one part of the anion exchanger in the desalting compartment  
is made of II type anion exchanger.

*The References*

Liang (Liang '422)

5,292,422

Mar. 8, 1994

Liang (Liang '037)

6,649,037 B2

Nov. 18, 2003

*The Rejections*

The claims stand rejected as follows: claims 1, 2 and 4-6 under 35 U.S.C. § 102(e) or, in the alternative, under 35 U.S.C. § 103 over Liang '037, and claim 7 under 35 U.S.C. § 103 over Liang '037 in view of Liang '422.

OPINION

We reverse the Examiner's rejections. We need to address only the sole independent claim, i.e., claim 1.<sup>1</sup>

*Issue*

Has the Appellant shown reversible error in the Examiner's determination that Liang discloses, or would have rendered prima facie obvious, to one of ordinary skill in the art, an electrodeionization apparatus capable of introducing part of deionized water obtained from desalting compartments into concentrating compartments at a side near the outlets for the deionized water of the desalting compartments, or 2) flowing concentrated water out of the concentrating compartments at a side near a raw water inlet to the desalting compartments?

*Findings of Fact*

Liang '037 discloses an electrodeionization apparatus comprising, in one embodiment, a first stage depletion compartment (10) outlet (which

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<sup>1</sup> The Examiner does not rely upon Liang '422 for any disclosure that remedies the deficiency in Liang '037 as to the independent claim (Ans. 5-6).

corresponds to the Appellant's desalting compartment outlet) from which the first stage product is fed to the inlets of second stage depletion (30) and<sup>1</sup> concentrating (40) compartments (col. 14, ll. 58-62; col. 15, ll. 9-11; Fig. 1). In another embodiment the product from a first depletion compartment (620) is fed to the inlet of a second depletion compartment (630) within the same module (col. 11, ll. 32-61; Fig. 13).

*Analysis*

The Appellant argues, regarding both of the above-mentioned embodiments, that Liang '037 does not disclose or suggest feeding a portion of the product from a depletion compartment back to the concentrating compartment of that stage (Br. 9-11; Reply Br. 2-4).

The Examiner argues:

Figure 13 of the Liang '037 patent discloses the introduction of water at a side near the outlets for the water of a desalting compartment and the water flows out of the compartment at a side near an inlet for the water (see figure 13 and col. 11, lines 31-61). The material being treated in the compartments is given little or no patentable weight in an apparatus claim. [Ans. 6]

...

When the entire [Liang '037] patent is perused and not merely Figure 1, the invention as claimed with the placement of the inlets to some compartments are [sic] adjacent outlets of other compartments is clearly disclosed by Liang '037. Figure 13 as recited above, shows the introduction of water from the outlet of a compartment fed to the inlet of another compartment. Furthermore, the terms "desalting compartments" and "concentrating compartments" as defined in the instant claims are compartments placed between anolyte and catholyte compartments separated by anion and cation membranes having ion exchanger therein. The compartments shown and described in Figure 13 read upon such an arrangement.

Furthermore, with respect to the use of a single module as presently claimed and argued or a [sic] two or more modules as suggested in Figure 1, the Liang '037 patent teaches that one such a modification to a single module or other plural modules would have been possible ways to arrange the electrodeionization apparatus (see col. 10, lines 57-65). [Ans. 7]

The Examiner has the initial burden of establishing a prima facie case of anticipation by pointing out where all of the claim limitations appear in a single reference. See *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990); *In re King*, 801 F.2d 1324, 1327 (Fed. Cir. 1986).

The Examiner's arguments set forth above do not explain where Liang '037 discloses an apparatus capable of 1) introducing a part of the deionized water from desalting compartments into concentrating compartments at a side near the outlets for the deionized water of the desalting compartments, or 2) flowing concentrated water out of the concentrating compartments at a side near a raw water inlet to the desalting compartments. To meet the requirements of the Appellant's independent claim the Liang '037 apparatus must have those capabilities, and the Examiner has not established that it does so.

For the Appellant's claimed invention to be anticipated, Liang '037 must lead one of ordinary skill in the art to a composition which falls within the scope of the claim "without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972).

The Examiner has combined the Liang '037 Figures 1 and 13 without establishing a direct relation of the relied-upon features. Moreover, the

Examiner has not identified features of those figures which, when combined, would be capable of 1) introducing a part of the deionized water from desalting compartments into concentrating compartments at a side near the outlets for the deionized water of the desalting compartments, or 2) flowing concentrated water out of the concentrating compartments at a side near a raw water inlet to the desalting compartments.

Regarding the obviousness rejection the Examiner argues (Ans. 5):

In the alternative, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the disclosure of the Liang patent to recycle the water from the desalting compartment outlet to the inlet of the concentrating compartment in the same module, because given the disclosure of Liang one having ordinary skill in the art would find it predictable to select from the variety of different configurations based upon the material being treated and removed to obtain the purified product.

As stated in *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007), “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Even if, as argued by the Examiner, one of ordinary skill in the art would have found it predictable to make selections from among the Liang ‘037 disclosed configurations based upon the material being treated and removed, that argument is not sufficient for establishing a prima facie case of obviousness of the Appellant’s claimed invention. The Examiner must provide the required articulated reasoning with rational underpinning which shows that one of ordinary skill in the art would have been led by

Liang '037 to make selections that result in the Appellant's claimed apparatus, and the Examiner has not done so.

*Conclusion of Law*

The Appellant has shown reversible error in the Examiner's determination that Liang discloses, expressly or inherently, or would have rendered prima facie obvious, to one of ordinary skill in the art, an electrodeionization apparatus capable of introducing part of deionized water obtained from desalting compartments into concentrating compartments at a side near the outlets for the deionized water of the desalting compartments, or 2) flowing concentrated water out of the concentrating compartments at a side near a raw water inlet to the desalting compartments.

DECISION/ORDER

The rejections of claims 1, 2 and 4-6 under 35 U.S.C. § 102(e) or, in the alternative, under 35 U.S.C. § 103 over Liang '037, and claim 7 under 35 U.S.C. § 103 over Liang '037 in view of Liang '422 are reversed.

It is ordered that the Examiner's decision is reversed.

REVERSED

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